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We claim:

1. The use of polymers obtainable by

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(i) free-radically initiated copolymerization of monomer mixtures of

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(a) at least one cationic monomer or quaternizable monomer

(b) optionally a water-soluble monomer,

(c) optionally a further free-radically copolymerizable monomer

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(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

(e) at least one regulator, where compounds which comprise sulfur in bonded form are used as regulator (e),

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(ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer,

25 in hair cosmetic preparations.

2. The use of polymers obtainable by

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(i) free-radically initiated copolymerization of monomer mixtures of

(a) at least one cationic monomer or quaternizable monomer

(b) optionally a water-soluble monomer,

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(c) optionally a further free-radically copolymerizable monomer

(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

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(e) at least one regulator, where compounds which comprise sulfur in bonded form are used as regulator (e),

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(ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer,

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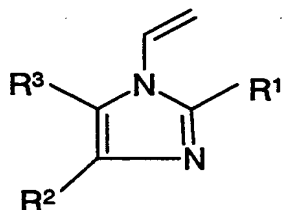
as conditioning agents in cosmetic preparations.

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3. The use as claimed in claim 2 in skin and/or hair cosmetic preparations.

4. The use as claimed in any of claims 1 to 3, where
10 N-vinylimidazole derivatives of the formula (I), in which R¹ to R³ are hydrogen, C₁-C₄-alkyl or phenyl, are used as monomer (a)

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(I) .

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5. The use as claimed in any of claims 1 to 3, where N-vinyl lactams are used as monomer (b).

6. The use as claimed in claim 5, where thiols are used as
25 regulator.

7. A polymer obtainable by

(i) free-radically initiated copolymerization of monomer
30 mixtures of

- (a) at least one cationic monomer or quaternizable monomer
- (b) optionally at least one water-soluble monomer,
- 35 (c) optionally at least one further free-radically copolymerizable monomer
- (d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and
- 40 (e) at least one polyfunctional regulator

(ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

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8. A polymer as claimed in claim 7, where N-vinylimidazole derivatives of the formula (I) in which R¹ to R³ are hydrogen, C₁-C₄-alkyl or phenyl are used as monomer (a).
- 5 9. A polymer as claimed in claim 7, where vinyl lactams are used as monomer (b).
10. A polymer as claimed in claim 7, where compounds which comprise sulfur in bonded form are used as polyfunctional regulator (e).
- 10 11. A polymer as claimed in claim 10, where thiols are used as polyfunctional regulator (e).
- 15 12. A polymer as claimed in claim 7 obtainable by
 - (i) free-radically initiated copolymerization of monomer mixtures of
 - 20 (a) 1 to 99.98% by weight of at least one cationic monomer or quaternizable monomer
 - (b) 0 to 98.98% by weight of at least one water-soluble monomer,
 - (c) 0 to 50% by weight of at least one further
 - 25 free-radically copolymerizable monomer and
 - (d) 0.01 to 10% by weight of at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and
 - (e) 0.01 to 10% by weight of at least one polyfunctional
 - 30 regulator
 - (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.
- 35 13. A process for the preparation of polymers by free-radical initiated copolymerization of a monomer mixture of
 - (a) at least one cationic monomer or quaternizable monomer
 - 40 (b) optionally at least one water-soluble monomer,
 - (c) optionally at least one further free-radically copolymerizable monomer
 - (d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds,
 - 45 in the presence of a polyfunctional regulator (e)

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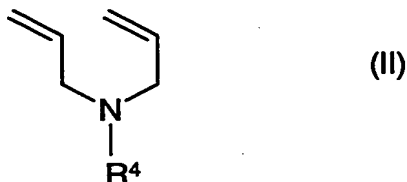
and subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

5 14. A polymer obtainable by

(i) free-radically initiated copolymerization of monomer mixtures of

- 10 (a) 2 to 70% by weight of a cationic monomer or quaternizable monomer chosen from the group consisting of diallylamines of the formula (II), in which R^4 is C_1 - C_{24} -alkyl

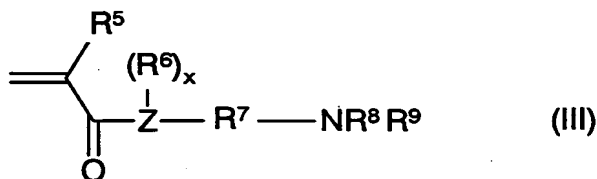
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and N,N-dialkylaminoalkyl acrylates and methacrylates and N,N-dialkylaminoalkylacrylamides and -methacrylamides of the formula (III),

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where R^5 , R^6 , independently, are a hydrogen atom or a methyl radical, R^7 is an alkylene radical having 1 to 24 carbon atoms, optionally substituted by alkyl radicals, and R^8 , R^9 are C_1 - C_{24} alkyl radicals. Z is a nitrogen atom together with $x = 1$ or is an oxygen atom together with $x = 0$,

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(b) 22 to 97.98% by weight of at least one water-soluble monomer chosen from N-vinyl lactams,

(c) 0 to 50% by weight of at least one further free-radically copolymerizable monomer,

(d) 0.01 to 10% by weight of at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

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(e) 0.01 to 10% by weight of at least one regulator

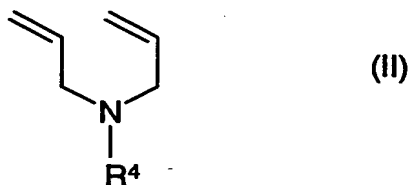
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- (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

5 15. A process for the preparation of polymers by free-radically initiated copolymerization of a monomer mixture of

- 10 (a) 2 to 70% by weight of at least one cationic monomer or quaternizable monomer chosen from the group consisting of diallylamines of the formula (II) in which R⁴ is C₁-C₂₄-alkyl

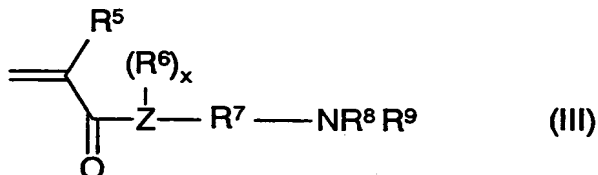
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and N,N-dialkylaminoalkyl acrylates and methacrylates and N,N-dialkylaminoalkylacrylamides and -methacrylamides of the formula (III),

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35 where R⁵, R⁶, independently, are a hydrogen atom or a methyl radical, R⁷ is an alkylene radical having 1 to 24 carbon atoms, optionally substituted by alkyl radicals, and R⁸, R⁹ are C₁-C₂₄-alkyl radicals. Z is a nitrogen atom together with x = 1 or is an oxygen atom together with x = 0,

- 40 (b) 22 to 97.98% by weight of at least one water-soluble monomer chosen from N-vinyl lactams,
 (c) optionally at least one further free-radically copolymerizable monomer,
 (d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds,

45 in the presence of a regulator (e)

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and subsequent quaternization or protonation of the polymer,
if the monomer (a) is a nonquaternized monomer or an only
partially quaternized monomer.

5 16. The use of the polymers as claimed in at least one of claims
7 to 12 and/or claim 14 in cosmetic preparations.

17. The use of the polymers as claimed in at least one of claims
7 to 12 and/or claim 14 as conditioning agents.

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Crosslinked cationic copolymers with regulators and their use in hair cosmetic preparations

5 Abstract

The invention relates to the use of polymers obtainable by

10 (i) free-radically initiated copolymerization of monomer mixtures of

(a) at least one cationic monomer or quaternizable monomer
(b) optionally a water-soluble monomer,
15 (c) optionally a further free-radically copolymerizable monomer

(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and
20 (e) at least one regulator

20 (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or is an only partially quaternized monomer,

25 in hair cosmetic preparations.

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